USC School of Architecture

Semester: FALL 2020 Units: 4
University of Southern California
School of Architecture
Prerequisite: NONE

ARCH 205aL: ARCHITECTURE FOR ENGINEERS
The process and communication of building design: Physical building shells, systems for structure, enclosure, and space ordering.

Instructor/Coordinator: ***Adjunct Assoc. Professor Mina M. Chow, AIA, NCARB***
Schedule: MON/WED 1:00pm-3:50pm Location: WATTB12, Zoom online/ Blackboard.
Office Hours: M W ***by appointment***. Please note all student texts/emails will be addressed in a timely manner. ***Please respect time zones for all communication.***
email: minachow@usc.edu

This is a foundation studio course in an interdisciplinary program with the School of Engineering that first was established in the 1970's. The three-year interdisciplinary program is based in the School of Civil and Environmental Engineering Studies. This program will familiarize the student with architecture, landscape architecture, planning, structural, mechanical, and electrical engineering and the related issues that contribute to the built environment for our society. It introduces the process of coordinating all of these aspects for the engineering student.

This course will help the student comprehend the nature of order in our surroundings, and to create an appreciation and understanding of how and why these systems are established. Projects will focus on the intrinsic properties of materials applied in structural and conceptual expression. The primary objective is to expose students to current issues related to design in architecture, and to teach the intrinsic nature of architecture developed through principles based on the design and construction process.

This first course will explore basic principles of 2 and 3 dimensional compositions though a series of design exercises, discussions, and critiques; focusing on the intrinsic properties of materials applied in structural and conceptual expression. Emphasis is placed on design as a creative, conceptually driven, iterative process. Attention is given to theories of context, unity, order, proportion, shape, balance, form, and space as they apply to abstract composition and structural design. Expression of ideas and values present in physical form are explored through observation, analysis, transformation, and synthesis. Students develop and document projects using a variety of means, including model making, REVIT or OTHER software programs, sketching, mechanical drawing, and photography. ***Project craft and execution (IRL or digitally) are emphasized.*** In summary, the lectures, discussions and design problems will begin to **reveal how architects and design professionals think, and what they *must* think** about when designing a building or a space.

Academic Integrity
USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to **avoid using another's work as one's own**. All students are expected to understand and abide by these principles. Scampus Part B contains the Student Conduct Code in Section 10, while the recommended sanctions are located in Section 11: https://policy.usc.edu/scampus-part-b/

Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. Membership in the academic community places a special obligation on all members to preserve an atmosphere conducive to the freedom to teach and to learn. Part of that obligation implies the responsibility of

each member of the USC community to maintain a positive learning environment in which the behavior of any individual does not disrupt the classes of teachers or learners. It is the responsibility of the individual faculty member to determine, maintain and enforce the standards of behavior acceptable to preserving an atmosphere appropriate for teaching and learning. Students will be warned if their behavior is evaluated by the faculty member as disruptive. Sanctions may include a range of responses from immediate removal from class to referral to the appropriate academic unit and/or the Office of Student Judicial Affairs and Community Standards to review pertinent alleged university violations of ethical and behavioral standards. Significant and/or continued violations may result 'in administrative withdrawal from the class.

Sustainability:
In addition, the studio will address the important role architects and engineers direct in the sustainability of our environment. We will discuss the 2030 Challenge in how design should *engage the environment* in a way that dramatically reduces or eliminates the need for fossil fuel and find applications to the design of our structures.

Diversity, Equity & Inclusion:
The class supports the discussion of diverse ideas and intend to make the classroom a safe environment to talk about diverse approaches to building better communities. The classroom follows the USC Principles of Community: https://diversity.usc.edu/usc-principles-of-community/
And the School of Architecture Mission & Vision: https://arch.usc.edu/diversity-equity-inclusion

For more resources:
SCampus Part D, Section 1: Free Expression and Dissent
https://policy.usc.edu/scampus-part-d/
USC Campus and Student Affairs
https://diversity.usc.edu/campus-and-student-affairs-resources/
DSP and Universal Design for Learning (UDL): https://dsp.usc.edu/
http://www.udlcenter.org/aboutudl/whatisudl

COURSE OBJECTIVES:

A) Apply two and three-dimensional formal design principles and theories to simple design exercises.

B) Investigate intrinsic properties of materials applied in structural and conceptual expression to create original (IRL) design projects.

C) Develop alternative solutions to a given or self-defined design problem through an iterative design process.

D) Employ fundamental theories of visual perception for spatial unity, dialog, contrast, balance, tension, rhythm, and harmony in creative documentation and representation of design projects.

E) Use research, critical thinking, and analytical skills to discover the cultural values embedded in physical objects and spaces created by a society.

F) Through abstraction and transformation, create designs that express identity and meaning of their subject(s) and/or context(s).

G) Employ ordering principals and systems (i.e.-- proportion, scale, solid/void, figure/ground, balance and symmetry, balance and asymmetry) to organize a design solution that clearly reflects a design concept.

H) Demonstrate mastery of basic presentation craft and organization though verbal, graphic, and model building means.

I) Communicate clearly using verbal, graphic and physical model-making skills, an intentional and comprehensive design concept.

COURSE CONTENT:

Analysis:

1. **Research:** Students will perform research IRL at libraries and/or use trusted online scholarly portals, and/or investigate primary sources.
2. **Observation**: The relationship of the whole environment to its parts, especially as related to the structure of building elements.
3. **Formal Analysis:** Introduction to two and three-dimensional analytical techniques.
4. **Contextual Analysis:** Study of factors effecting the perception and meaning of environments.
5. **Problem Analysis**: Investigating constraints and opportunities presented by a variety of design problems.
6. **Application:** Synthesis of the above critical process into coherent design solutions that creatively address issues revealed through analysis.

Design Principles:

1. **Primary Elements of Form:** What they are and how they relate to the design of structures.
2. **Form Generation:** How forms are generated and used in the design process.
3. **Context and meaning:** The interrelationships between an object, its environment, and meaning.
4. **Scale:** How size and proportion affect meaning.

Organizational Principles:

1. **Proportion:** Ancient and modern systems used to organize works of architecture and art. How proportional systems are used to organize designs.
2. **Balance and Symmetry:** How balance and symmetry affect meaning and perception of form.
3. **Balance and Asymmetry:** How balance is achieved between design elements in asymmetrical relationships.
4. **Figure/Ground:** How figure and ground interact to create and define spatial relationships.
5. **Solid/Void:** Solid and void interrelationships and their effect on meaning and experience.

Design realization:

1. **Synthesis:** Integration and resolution of disparate and conflicting design issues into clear, well-organized, aesthetically and structurally sound solutions.

COURSE OBJECTIVES WILL BE ACHIEVED THROUGH THE FOLLOWING:

1. Design studio assignments.
2. Discussions, active-learning presentations.
3. Project critiques and reviews
4. Final project.

ASSIGNMENTS/GRADING:

60% (5) Design Studio Assignments
25% (1) Final Project
15% Attendance and participation for studio talks and discussions.

RECOMMENDED DRAWING EQUIPMENT:
Due to the COVID pandemic, please check in advance with retailer websites for best prices. You may also find other deals or use other comparable equipment. All graphic software may be used (ie.—Sketch-Up, ACAD, Revit, etc… and others) BUT clarity and depth will be evaluated equitably.

Blick Art Supplies CONTACT:
Adam Crouse, Western District Sales and Outreach Manager
7301 West Beverly Blvd. Los Angeles, CA 90036
Mobile: 213-819-4417l Fax: 323-978-2832
A.Crouse@dickblick.com l www.dickblick.com

--Drafting board or parallel rule (42" recommended)
--Adjustable triangles (30/60, 45 degrees)
--Architectural & Engineering scales (1/16", 1/8", 1/4", 1/2", etc… and 1:10, 1:20, 1:30 etc…)
--Drafting leads and mechanical pencils (H, 2H, 3H, F, B, 2B etc…)
--Drafting lead holder
--Sketch pencils and pens
--Eraser(s)
--Eraser shield(s)
--Trace paper (white or buff color)
--Metal straightedge

Students may purchase Clearprint no. 1000 HP vellum paper or mylar—as needed for individual or group project prints.

REFERENCES:
Readings will be from the following texts.
Required books may checked out from our library. For more information, visit USC Libraries OER Guide http://libguides.usc.edu/oer
Some will be ***provided in advance*** on: https://blackboard.usc.edu.

REQUIRED:
Architecture: Form Space and Order *4th ed. Ching, Francis, D.K. (2014) John Wiley & Sons;*
($36) ***eText ISBN:*** *9781118745199, 1118745191*
https://www.wiley.com/en-us/search?pq=1118745191%7Crelevance
($55) ***Print ISBN****: 9781118745083, 1118745086*
http://www.wiley.com/WileyCDA/WileyTitle/productCd-1118745086.html

RECOMMENDED:
Structure and Design *1st edition Schierle, Goetz. G. (June 2008) Cognella, Inc.;*
($59-$72) ***Print ISBN:*** *ISBN-13: 978-1934269374 ISBN-10: 1934269379*
http://www.amazon.com/gp/offerlisting/1934269379/ref=sr_1_1_olp?s=books&ie=UTF8&qid=1471475409&sr=1-1&keywords=structure+and+design

Understanding Architecture, 2nd Ed., Steen Eiler Rasmussen, The MIT Press; (1964) ISBN-10: 0262680025.
Precedents in Architecture*, 2nd, 3rd or 4th editions, 2004, 2005, 2012, Clark, Pause.*
Art and Visual Perception *A psychology of the creative Eye. The New Version 2nd edition, Arnheim, Rudolph, (July 1983) Univ. California Press; ISBN: 0520026136*

CLASS SCHEDULE (SUBJECT TO CHANGE- PLEASE STAY INFORMED):

Week 1 INTRODUCTION & ORIENTATION, REVIEW COURSE HANDOUTS
MON AUG 17
DISCUSSION: ***"WHAT is Architecture?" & "FIGURE GROUND"***
HANDOUT: A1_Definition of 2 Squares
HOMEWORK:
--**READ** Ching, Francis. *Form, Space and Order*, Chapter 7, p.349 – 423, provided on Blackboard.
--**READ** Lauer, David and Stephen Tentak. *Design Basics*, Chapter 2, 3, 4, 5, 6, provided on Blackboard.
--CREATE 4-5 test compositions of "Definition of 2 Squares" @ ½ size (9" x 12") for class review.

WED AUG 19
DISCUSSION/EXERCISE: ***"CONTOUR LINE COMPOSITION"***
--REVIEW READINGS AND ASSIGNMENT COMPOSITIONS
HOMEWORK:
--**READ** Dondis, Donis A. Primer of Visual Literacy, as provided on Blackboard.
--**READ** Gargis, Jacqueline. *Ideas Of Order: A Formal Approach Architecture*-- as provided on Blackboard.
--**REVISE** 4-5 test compositions of "Definition of 2 Squares" @ ½ size (9" x 12") for class review.
--**SKETCH** pure contour drawings (**10 total in sketchbook DUE: Wed 08/26/20**).

Week 2

MON AUG 24
REVIEW: "A1: Definition of 2 Squares"
DISCUSSION: *"DIAGRAM & ABSTRACTION"*
HANDOUT: A2: Historic Precedent
HOMEWORK: Research & Diagramming

WED AUG 26
Sketchbook Assignment #1 DUE
CLASS DISCUSSION/ REVIEW: "RESEARCH"
3:00pm WOODSHOP ORIENTATION with Chris Beas
HOMEWORK: Research & Diagramming

Week 3
MON AUG 31
REVIEW: "A2: Historic Precedent" DIAGRAMS DUE
CLASS DISCUSSION: *"PAPER TOWER "*
HANDOUT: A3_Paper Tower
HOMEWORK: A3: Paper Tower Research and Study models
Create (6) paper studies manipulating 8 ½ x 11" paper.
Start development of Protocol Unit(s)

WED SEP 2
REVIEW Paper Tower Research and Study Models
DISCUSSION: "*DRAWINGS: ORTHOGRAPHIC PROJECTIONS"*
HOMEWORK: Continue development of Protocol Unit(s)

Week 4
MON SEP 7
LABOR DAY Holiday — NO CLASS!

WED SEP 9
GROUP CRIT: A3: Paper Tower Protocol Units
WORKSHOP: Plans, Elevations, Sections
HOMEWORK: Continue development of Protocol Unit(s)
START plan, section, elevation studies.

Week 5
MON SEP 14
INDIV CRITS: A3: Paper Tower Protocol Units
HOMEWORK: Continue development of Protocol Unit(s)
CON'T plan, section, elevation studies.
START Final Model after consultation.

WED SEP 16
INDIV CRITS: A3: Paper Tower
HOMEWORK: Continue development of Protocol Unit(s)
CON'T plan, section, elevation studies.
START Final Model after consultation.

Week 6
MON SEP 21
INDIV CRITS: A3: Paper Tower
HOMEWORK: START Final Drawings

WED SEP 23
REVIEW: "A2: Paper Tower" DUE
HANDOUT: A4: Cardboard *"Shelter"*
HOMEWORK: "Cardboard Shelter" Research
--**READ** Rasmussen, Steen Elier, *Experiencing Architecture, Chapter V, pp. 104-126*
--**WRITE** Research Report.

RESEARCH REPORT REQUIREMENTS:

1. Select/Research (3) "shelter" or chair precedents based on strong concept and a relationship to its construction material(s).
2. Describe *why* you selected each precedent, what are the *concept(s)* behind it, what are the *relationships to the human body* and *how they manifest* in the form, connections and details.
3. 8 ½ x 11" format, Arrange each page in 2 columns. One(1) column for visual images, one (1) column for descriptive text.

Week 7

MON SEP 28 Yom Kippur — **PEER/ INDIV CRITS: A4: Cardboard "*Shelter*"**
REVIEW READING/ LECTURE: "Cardboard Shelter/Partition"
HOMEWORK: "Cardboard Shelter or Chair" Study models

WED SEP 30 — **PEER/ INDIV CRITS: A4: Cardboard "*Shelter*"**
HOMEWORK: "Cardboard Shelter or Chair" Study models

Week 8

MON OCT 5 — **PEER/ INDIV CRITS: A4: Cardboard "*Shelter*"**
HOMEWORK: "Cardboard Shelter or Chair" Study models/ Layout drawings

WED OCT 7 — **DRAWINGS A4: Cardboard "*Shelter*"**
HOMEWORK: Final Drawings/ Start Construction

Week 9

MON OCT 12 — **FINAL DETAILS A4: Cardboard "*Shelter*"**
HOMEWORK: Final Drawings/ Complete Construction

WED OCT 14 — **REVIEW: A4: Cardboard *"Shelter"* DUE**
HANDOUT: A5: Historic Precedents

Week 10

MON OCT 19 — **Historic Precedents #5**

WED OCT 21 — **Historic Precedents #5**

Week11

MON OCT 26 — **Historic Precedents #5**

WED OCT 28 — **REVIEW: "Historic Precedents #5" DUE**
HANDOUT: "A6: Phenomenological Space" (Capture a phenomenon.)
DISCUSSION: *"PHENOMENA VS. MATERIAL"*
HOMEWORK: 1. RESEARCH phenomena/precedents. 2. SKETCH ideas.

Week 12

MON NOV 2 — **Phenomenological Garden RESEARCH DUE**
HOMEWORK: 1. ***Select and make site model.***

WED NOV 4	**Phenomenological Space: Peer Evaluations** **HOMEWORK:** 1. Study models and sketches.
Week 13	
MON NOV 9	**Phenomenological Space STUDIES:** ¼" sketches and ½" models **HOMEWORK:** 1. Study models and sketches. ***Explore 4 connection details.***
WED NOV 11	**Phenomenological Space STUDIES:** ¼" sketches and ½" models **HOMEWORK:** Continue development of 4 connection details. Start final 3D final construction.
NOV 13	LAST DAY OF CLASSES
Week 14	
MON NOV 16	**STUDY WEEK: Phenomenological Space** Individual Zoom Consultations & Peer Evaluations
WED NOV 18	**STUDY WEEK: Phenomenological Space** Individual Zoom Consultations & Peer Evaluations
Week 15	
MON NOV 23	**FINAL REVIEW: "Phenomenological Space"** **4:30-6:00pm**
TUES NOV 24	***PORTFOLIO DUE* @ 5:00PM**
NOV 25 - JAN 10	WINTER RECESS